

ing to 45 per cent. over the Chamonix figures; it was increased during the prolonged stay at the observatory, and on descending to Chamonix it only partially fell to the level of the ventilation before the ascent, an excess remaining for many weeks.

(2) *Changes in "Absolute Ventilation."*—The importance of this series of calculations rests on the possibility of comparing these changes with those in the "real ventilation," for it will be clear that if the views advanced by M. Vallot are sound, then such comparisons will indicate how far the augmentation in the "real" values through extra thoracic enlargement has sufficed to compensate for the diminution in the actual quantity of oxygen as the result of the diminished air pressure. In the case of M. Vallot, who by frequent visits and ascents was a "trained subject," it appeared that the high altitude always caused on arrival at the observatory an immediate fall in the total value of the absolute ventilation; this fall, although not large, was quite distinct, so that the increased thoracic work was apparently insufficient to compensate fully for the diminution in the quantity of inspired oxygen caused by the lowered atmospheric pressure. This continued for some days of the residence in the observatory, and then gradually became almost inappreciable, the deficiency being decreased by 50 per cent., indicating the gradual development of an acclimatisation compensation. As in the real ventilation, so here the descent to Chamonix was necessarily associated with an immediate and complete return to the normal condition.

The case of M. de Goumoens is still more interesting because more marked. He is spoken of as the "untrained" subject, and in his case the "absolute" value of the daily ventilation immediately fell considerably more than in the case of M. Vallot. This considerable fall occurred in spite of the circumstance that the compensatory thoracic work had shown a very marked increase. The continued life in the observatory was in M. de Goumoens's case associated with a much more notable adjustment of the absolute ventilation value than M. Vallot (the "trained" subject) showed, so that by the second week the deficit had diminished by 80 per cent. The descent to Chamonix was associated with the disappearance of the deficiency, but since the "real" value remained persistently increased, this caused the "absolute" value to be so much that instead of a deficiency there was now an excess of 30 per cent. over the previous Chamonix figures. Hence it appears that the respiratory mechanism responds by a compensatory increase, as regards mechanical work, when the subject is brought into a low atmospheric pressure, that this response is immediate, but is at this high altitude insufficient, and that the degree of insufficiency is less in those who have frequently undergone the experience. A further compensatory increase is then gradually brought into play which adds to the total and makes the whole compensation more nearly adequate, but this does not, as the immediate one does, cease when the subject returns to lower levels. It would thus seem probable, although M. Vallot does not himself give any definite suggestions on this point, that the immediate adjustment is one involving the respiratory nerve centres, whilst the slow adjustment involves the actual framework of the thorax.

The total change in respiratory ventilation value, whether "real" or "absolute," being itself brought about by either greater amplitude or greater frequency of respiration, it was necessary for M. Vallot to ascertain the share taken by each of these factors. The changes in frequency were

often very pronounced, but their periodicity and general character were so irregular that no direct relation between the real ventilation values and the frequencies could be ascertained. On the other hand, the results as regards amplitude were far more definite, and it would appear that this is the chief factor in the production of the compensatory effect. The details of the observations given by M. Vallot under this head need not be referred to, since their general character will be sufficiently indicated by the foregoing remarks. As regards the whole investigation, it will be evident that since several such series of experiments were undertaken, the researches described in this volume of the *Annales* indicate an immense amount of laborious and prolonged work, and M. Vallot is to be congratulated upon the solidity of the contribution which he has made to the physiology of respiration, and upon the pertinacity which he has displayed in his conduct of the whole inquiry; this pertinacity, combined with a rigorous limitation of the inquiry to one issue, has resulted in genuine achievement.

Two other short memoirs are bound up with the volume. The first of these deals with meteorological observations made on the Glacier de Tête-Rousse by M. Mougin and M. Bernard during the following periods:—August 1 to October 18, 1901; June 1 to October 10, 1902; and July 1 to October 13, 1903. The occurrence of rain, snow, dew, &c., is noted, and the daily temperatures, minimal and maximal, are tabulated. A series of special experiments was made as to the temperature of internal parts of the glacier. It appears from these that at a depth of 15 metres the temperature remained constantly at 0° C. throughout all the months of the year.

The third memoir is one by M. Henri Vallot. In this the author gives some further particulars as to the method which he has employed for mapping out the details of the Mont Blanc summit with its extensive glacier fields.

F. G.

SUCCESS OF ANTI-MALARIAL MEASURES.

TWO reports recently issued prove in a striking manner that malaria may be stamped out by the application of scientific measures directed against the malaria-bearing mosquitoes. The first report deals with Ismailia.¹ Malaria was introduced into Ismailia in 1877, and since 1886 nearly all the inhabitants have suffered from the disease. In 1901, on the initiative of Prince Auguste d'Arenberg, president of the Suez Canal Co., Prof. Ronald Ross was consulted, and, acting on his advice, a series of measures instituted which has had the welcome result of completely freeing Ismailia from malaria. These measures consisted in the destruction of mosquitoes, principally by filling in and draining the pools and marsh land, or treating these with petroleum where the *Anopheles* breed, concreting water courses, &c., and instructing the inhabitants and protecting their household water supplies. This has been attained at an initial cost of 50,000 francs, and an annual outlay of 18,300 francs.

These measures were commenced in 1903, and from that time the ordinary mosquitoes disappeared from Ismailia, so that mosquito nets are no longer necessary. Since the autumn of that year not a single *Anopheles* larva has been found in the protected zone, and no fresh cases of malaria have occurred. The number of cases of malaria per annum in Ismailia has been as high as 2500, and in 1902, before the

¹ "Suppression du Paludisme à Ismailia." (Compagnie Universelle du Canal maritime de Suez, Paris, 1906.)

anti-malarial campaign, there were 1550! The report is illustrated with interesting plans and diagrams.

At Port Swettenham, Federated Malay States, anti-malarial measures were commenced in 1901 and 1902, and the latest report,¹ by Drs. Travers and Watson, shows how great a measure of success has been attained. Among the Government employees, for example, in 1901 236 sick certificates were issued and 1026 days of leave were granted on account of malaria. In 1905 the figures were respectively four and thirty. Comment is needless.

NOTES.

At a special general meeting of the Royal Society of Edinburgh, held on December 21, the council presented a report on the new accommodation to be provided for the society in consequence of its proposed removal from the Royal Institution, under the provisions of the National Galleries (Scotland) Bill. We learn from this report that in March last a memorial was presented to the Secretary for Scotland directing attention to the needs of the society, and asking for a free grant of 600*l.* a year. In a semi-official reply to this memorial the general secretary of the society was informed that a proposal was being entertained by the Government to devote the whole of the Royal Institution to the purposes of art, and that the Royal Society must contemplate the necessity for finding accommodation elsewhere. As it appeared from correspondence and an interview with the Secretary for Scotland that the Government had definitely decided to allot the whole of the Royal Institution for the purposes of art, the council resolved, with great reluctance, to accept the necessity for removal, and to do its best to secure adequate reinstatement. An accommodation committee was therefore appointed by the society to advise the Secretary for Scotland regarding sites and buildings suitable for new premises for the society, with the result that the committee unanimously recommended the building at present occupied by the Edinburgh Life Insurance Office, Nos. 22 and 24 George Street. At an interview on November 22 Mr. Sinclair offered, subject to the consent of Parliament, to purchase and adapt the George Street building on certain conditions, and in addition to give a free grant for the scientific purposes of the society. The conditions proposed were approved by the representatives of the society present as being, in the circumstances, an equitable settlement of the claims of the society. In a letter received by the general secretary, indicating the nature of the proposals which Mr. Sinclair intended to make in committee on the Bill in question, it was made clear that the society was to occupy the building on identical terms with those of the occupancy of the Royal Society at Burlington House. In the speech of the Secretary for Scotland on December 13, during the debate in Committee of the House of Commons on the Galleries Bill, the final proposals regarding the accommodation and grant to the society, recorded in last week's *NATURE* (p. 179) were described. Briefly, the arrangements are that a sum of 25,000*l.* will be used for the purchase of a building, and 3000*l.* to cover the expenses of fitting up, redecorating the new premises, and transferring the library and other effects of the society from the Royal Institution. The Treasury will also give the society a grant of not more than 600*l.* a year. The council expresses the opinion that these proposals meet the claims of the Royal Society both in respect of an additional grant and of reinstatement in suitable new premises. In conclusion, the council remarks

¹ *Journ. of Trop. Med.*, July 2.

in the report that the society owes a debt of gratitude to the Scottish Members of Parliament, to various members of the Royal Society of London, and to the British Science Guild for their loyal support in a time of difficulty. The report of the council was, on the motion of Sir William Turner, seconded by Prof. Bower, received and unanimously approved by the society at the special meeting on December 21.

THE death is announced of Dr. A. W. Panton, tutor and lecturer on mathematics at Trinity College, Dublin. Dr. Panton made several useful contributions to mathematical science, and was the author, in conjunction with his colleague, Prof. W. S. Burnside, of a standard work on "The Theory of Equations."

THE *Petit Parisien* recently invited its readers to vote on the question of the relative preeminence of great Frenchmen of the nineteenth century. The result is recorded in Monday's *Times*. Fifteen million answers were received; and Pasteur's name headed the list with 1,338,425 votes, Victor Hugo, in the second place, being more than one hundred thousand votes behind him. In addition to Pasteur, the following is the order of the names of men of science who appear among the first twenty in the list:—Prof. Curie; Dr. Roux; Parmentier, who introduced the potato into France; Ampère; Arago; and Chevreul, the chemist. It is clear from the results of this *plébiscite* that the French people cherish the memories of the scientific investigators whose work has contributed, not only to national renown, but also to the advancement of knowledge throughout the world.

REUTER reports the following severe earthquake shocks during the past few days:—*December 22, Kopal, Semirechensk*.—An extremely violent earthquake shock, lasting one and a half minutes, was felt in this district at 11.20 p.m. *Rome*.—The seismographic instruments at the observatories of Bologna and Florence recorded in the evening a violent earthquake estimated to have originated at a distance of 7000 kilometres. *December 26, Santiago de Chile*.—A strong shock of earthquake is reported from Arica. Shocks were felt at Iquique and Pisagua.

A REUTER message from Naples states that a portion of the crater of Vesuvius fell in on December 20, with the result that a shower of ash fell over Naples for twenty minutes so thickly as to obscure all view of the volcano. Later in the day the ash ceased to fall at Naples, but continued in the direction of Portici and Pompeii.

THE St. Petersburg correspondent of the *Globe* reports that an expedition for the exploration of the Arctic regions is being equipped under the leadership of Lieut.-Colonel Sergeyeff. The expedition will last for several years, and will start from Yeniseisk, and try to reach Bering Strait.

In the September number of *Terrestrial Magnetism* Prof. G. B. Rizzo states that on September 7, 1905, some hours before the Calabrian earthquake of last year, a land surveyor at Monteleone found the needle of his compass so much disturbed that he was compelled to discontinue work. In Japan great earthquakes have been known for some time to be preceded by magnetic disturbances, but we are not aware that any of these have been so large as that recorded by Prof. Rizzo.

THE annual conversazione of the Royal College of Science and Royal School of Mines Students' Union was held on December 19 at the College in Exhibition Road, South Kensington. There were exhibits and demonstrations